

# ADAPTATION STRATEGY OF COMMUNITIES FACING COASTAL HAZARD IN DEMAK COASTAL AREA

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## ABSTRACT

**D**emak coastal area is one of vulnerable areas to tidal flood. Tidal flood that occurs continuously has negative impacts on coastal communities. These negative impacts include the effects of physical, social, economic, and environmental. Thus the necessary existence of community adaptation strategies to face the tidal flood. This study aims to assess adaptation strategies of communities in Demak coastal areas. The methods used in this research are the field survey, in-depth interview and Focus Group Discussion (FGD). Field survey was conducted to collect data on the condition of research area. In-depth interview was conducted to obtain information from the relevant authorities, namely Regional Disaster Management Agency and Department of Public Work. Data were analyzed descriptively qualitative. The results showed that people in the Demak coastal area has several strategies to face tidal flood that often occur in the region. Adaptation is performed on residential buildings, roads, and ponds. Adaptations made by raising building houses, making embankment, planting mangroves in the coastal areas, and forming communities caring tidal flood.

**Keywords:** Adaptation Strategy, Coastal Area, Coastal Hazard, Tidal Flood

## INTRODUCTION

Demak coastal area which is adjoining with Semarang coastal area has been affected by the disaster that occurred in Semarang coastal area. The most common disaster in the world is flood (Singh and Devkota, 2015). Almost along the coastal area in Demak experience tidal flood. This is in line with statement of Tu and Nitivattananon (2011) that coastal area has effect on sea level rise which is causing tidal flood. Some of the areas most severely affected by tidal flood is Sayung, Karang Tengah, and Bonang District. This tidal flood has negative impacts for community, especially for people who live close to the coastline. In addition to the social impact, people also feel the impact of the physical, economic, and environmental. That physical damage makes the social and economic activity becomes disturbed. Research on coastal disasters have been done, such as Mills et al. (2005) and Marfai et al (2008).

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- a. Land subsidence so that houses sinking and must be lifted. Roads and other public facilities should also be in lifted.

- b. Garbage carried by tidal flood causing residential areas and ponds look shabby. Garbage in the pond will also cause the fish died due to poison. While the waste that goes to the settlement will lead to disease.



a. Fishponds Flooded



b. Settlements and public facilities flooded



c. Land Subsidence



d. Trash carried by tidal flood

Picture 1. Various Major Problems Arise due to Tidal Flooding

The many problems posed by the tidal flood encourage people to form groups concerned the tidal flood. The groups that have been formed namely the mangrove group, fisherman group, and fish farmer group. Mangrove group came after there was problem of great tidal flood, abrasion, sea water intrusion, and land subsidence after the 2000s. Then in 2004 the Government initiated the formation of mangrove group to gather the villagers and do counseling about mangrove to the citizens. Residents are also invited to a comparative study in Banyumas Regency to know about breeding of mangrove. After that, mangrove group is formed and get any help from the government to multiply mangrove in this area until now. Fish farmer group appears, since tidal flood often occur with land subsidence had impacts in the paddy field near the coastal permanently submerged in water and finally converted as pond. The greatest landuse change from wetland to the pond started in the 2000s. Meanwhile, fishermen group had always been there in this area.

Various efforts have been made by community groups in Demak coastal area to address the issue of tidal flood disaster. One such effort is the planting of mangrove in the rural areas, rivers, and fishponds (Picture 2). However, mangrove planting indirectly to the sea because it is not an administrative area. There is also socialization to fish farmers and fishermen to participate on planting mangrove, to prevent the impacts of abrasion and tidal

flood (Picture 3). Making the dike around the pond is also done by farmers to prevent loss of fish from ponds. One thing that is also important is to comply with tidal flood's schedule from government, to anticipate the impact of tidal flood.



a. Newly Planted Mangrove



b. Existing Mangrove

Picture 2. Mangrove Planting

The formation of community groups in Demak coastal area give positive impacts on society. Mangrove planting reduce damage to embankment around the pond from the force of the tidal flood. Another benefit of planting mangrove in ponds is a spawning ground, habitat, obtaining nutrients for fish. This statement does not necessarily appear in public, once there was news blows that by planting mangroves in the pond will poison the fish in it. But after the group was standing, residents were given explanations and finally they changed their minds. Planting mangroves in the rivers bordering the sea also can protect water bodies from abrasion, so the river path is maintained.



Picture 3. Socialization of Government

Efforts undertaken society groups can not be separated from the constraints faced. Initially there were constraints of public trust in the benefits of mangrove, but then could be convinced to see the results directly. To convince the citizens, the group running the mangrove planting on their ponds. After that, when the benefits can already be seen and felt by the citizens, they will follow the other people who had planted mangroves. This is considered

very effective way to convince citizens. Another issue is the treatment of mangrove trees were pretty hard at the beginning of the planting.

Talking about community strategies, there are some parts that need to be discussed, social and economic strategies of society to face this disaster. Social strategy on community is coexist to the disaster (Picture 4). As it is said that the tidal flood is not a disaster which has once impact, but there was anytime happen and continuously. These conditions make the people become accustomed to the presence of the tidal flood. People can not do much to prevent tidal flood, because it is regarded as a complex issue and not just one area that must be rehabilitated to stop it.



Picture 4. Community Coexist with Tidal Flood

However residents still have the efforts (Picture 5). Before the tidal flood happen, people obey the flooding schedule given by the department of marine and fisheries. After looking at the flooding schedule, the people will know what must be done as elevating ponds embankment or go home to avoid roads inundated. When people have not obeyed this flooding schedule, then it becomes worse. Their ponds could be washed away or they will get stuck and not be able to go home because isolated by high tidal flood.

Strategies to elevate the building and the street is a strategy undertaken after tidal flood happened many times. So the people do not plan to elevate the building regularly. It has an impact on the economic strategy of its own citizens. People do not have the special economic strategies, such as having special saving to elevate the house, or insurance for his house. Beside the above problems, the lack of economic strategy also caused by the type of work whose the income is uncertain. When income from main employment is not enough, then the people will do the job diversification.





a. Making Road Embankment

b. Making Sewer



c. Elevating Building



d. Making Embankment in front of House

Picture 5. Adaptation Strategies of Community

One interesting thing is what will be done if the tidal flood become wider and the puddle become higher. People explained that they could not move out of this area despite the tidal flood will continue happen. The reason is their culture and their ancestors are from this land, so that they would not leave. Moreover, the reason "will move where?" is also a thorny issue. Considering they do not have land elsewhere, whereas if will sell the land that now has no value anymore. On the other hand, people retain their region because it has abundant natural resources. Marine products they get are still great, and shall be sufficient for their lives.

## CONCLUSION

Demak coastal area is one of vulnerable areas to tidal flood. Tidal flood that occurs continuously has negative impacts on coastal communities. Various major problems arise due to tidal flood such as fishponds flooded, settlements and public facilities flooded causing damage, land subsidence, garbage carried by tidal flood causing residential areas and ponds look shabby and will lead to disease.

People in Demak coastal area has several strategies to face tidal flood that often occur in the region. Adaptation is performed on residential buildings, roads, and ponds. Adaptations made by raising building houses, making embankment, planting mangroves in the coastal areas, and forming communities caring tidal flood.

### **Acknowledgment**

Financial support was received from Ministry of Research and Technology – Higher Education of Indonesia by Excellent Research Grant for University.

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